A TERMINOLOGY FOR FEMALES WITH COLOR PATTERNS THAT MIMIC MALES[1]

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ABSTRACT: A portion of the female population in certain insects, especially some species of Odonata, have color forms which mimic the male color pattern. A confusing series of names have been applied by various authors to these male-mimicking females. This terminology is reviewed and a suggestion is made to use androchromatypic for male-mimicking females and gynochromatypic for females with the usual female color pattern.

Certain insect species have a portion of the female population with a color pattern that mimics male coloration. This has been described for a few butterflies (e.g. Clarke *et al.* 1985) and several Odonata, in particular species of *Ischnura* (Zygoptera: Coenagrionidae) and *Aeshna* (Anisoptera: Aeshnidae). Most of the published accounts have involved species of *Ischnura* in which the color patterns are further complicated by the fact that immature females are orange-brown and then change to green-black when they become sexually mature. In addition, old females often develop a greyish-white pruinosity that completely obscures the green-black ground coloration. Until these age-related color changes were understood, early publications often considered female populations to consist of two or more color forms. Grieve (1937) and Lyon (1915) reviewed this literature and also documented the gradual change from orange-brown to green-black coloration as *I. verticalis* females mature. I will ignore the terminology used for these age-related color forms and deal only with those terms that were applied to mature females.

There have been a number of such terms including andromorphic, homochrome, homoeochromatic, isochromatic and isomorphous for females with the male color pattern and heterochromatic, heterochrome, heteromorphic and heteromorphous for females which have the typical female color pattern. Until Johnson (1964), the most frequently used terms were some form of homochromatic and heterochromatic. In his study of the inheritance of female dimorphism in *I. damula,* Johnson (1964) examined the question of terminology and suggested using andromorphic (male-mimicking females) and heteromorphic ("typical" females) in order to avoid confusion with the cytogenetic meaning of the word heterochromatic. More recently, Garrison and Hafernik (1981), Hinnekint (1986) and Robertson (1985) have also employed andromorphic and heteromorphic for female color forms of *I. gemina, I. elegans* and *I. ramburi,* respectively.

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In my opinion, none of these terms is satisfactory. The suffix -morphic implies a morphological difference whereas it is one of color only. The prefixes homo- and hetero- mean similar and different, but don't specify similar to, or different from, what. For these reasons, I would suggest androchromatypic (from the Greek *aner* (male), *chroma* (color) and *typos* (pattern)) for females with a male-mimicking color pattern and gynochromatypic (from the Greek *gyne* (female)) for females with the usual female coloration.

Pasteur (1982) provided a classification for various mimicry systems. He didn't specifically deal with the case of females that have a male-mimicking color pattern. However, this situation is an example of automimicry which is itself a type of intraspecific mimicry where both model and mimic are different individuals within the species. Furthermore, Pasteur (1982) stated that when females mimic males this is a category of Wicklerian-Barlowian mimicry that is known as reproductive conjunct automimicry. In this case conjunct means that the model, mimic and dupe all belong to the same species and dupe "implies that (a) the animal perceived signals, (b) the signals were deceptive, and (c) the animal displayed active or passive behavior in response to the deception." (Pasteur 1982). For the species of *Ischnura* described above, the male is the model and dupe while the androchromatypic female is the mimic.

Hinnekint (1986) showed that in *I. elegans,* crowded conditions increased the number of andromorphic (i.e. androchromatypic) females and Robertson (1985) suggested that such females in *I. ramburi* have an advantage because only one mating is required. Additional copulations (which last 3 h) waste time for the females and may expose them to increased levels of predation. Therefore, by mimicking males in both color and behavior, androchromatypic females may be able to avoid extra matings more easily than gynochromatypic females.

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An introductory text for students, instructors, & research workers on the broad perspective of symbiosis and "parasitism".

THE SUCKING LICE OF NORTH AMERICA. AN ILLUSTRATED MANUAL FOR IDENTIFICATION. K.C. Kim, H.D. Pratt, & C.J. Stojanovich. 1986. Penn. State Univ. Press. 241 pp. $39.50.

The main body of this manual consists of illustrated keys to all known North American Anoplura, including 9 families, 19 genera, and 75 species. The male and female of each species are illustrated and briefly described with important taxonomic characters. Also included are chapters on collecting and preservation techniques, morphology and diagnostic characters, biology and immature stages, public health & veterinary importance, and parasite-host and host-parasite listings.

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